

## CLAIMS

I claim:

1. A photomultiplier tube base, comprising:  
electronic circuitry that provides stable power and gain control for dynode stages of a photomultiplier tube (PMT); and  
an amplifying circuit for amplifying a PMT output signal and producing an amplified PMT signal;  
wherein: the electronic circuitry and the amplifying circuit are integrated into one replaceable component that receives power from a PMT high voltage divider;  
the PMT base provides pulse shape enhancement; and  
the PMT base can be electrically connected to the PMT.
2. The PMT base of claim 1 wherein, the PMT output signal travels from an anode of the PMT to the amplifying circuit.
3. The PMT base of claim 1 wherein, the PMT output signal travels from a dynode of the PMT to the amplifying circuit.
4. The PMT base of claim 1 wherein, the PMT output signal travels from both  
a dynode and an anode of the PMT to the amplifying circuit.
5. The PMT base of claim 1 wherein, the amplifying circuit comprises a one transistor amplifier.
6. The PMT base of claim 1 wherein, the amplifying circuit comprises a

multi-  
stage amplifier.

7. A method of amplifying an output signal of a PMT, comprising the steps of:

integrating electronic circuitry, that provides stable power and gain control to dynode stages of the PMT, with an amplifying circuit, that amplifies the PMT output signal without disrupting the stable power, in a replaceable PMT base;

connecting the replaceable PMT base to the PMT wherein, connecting comprises electrically and mechanically connecting the PMT base to the PMT;

supplying power to the replaceable PMT base from a PMT high voltage divider; and

outputting from the PMT base an amplified PMT output signal with enhanced pulse shaping.

8. The method of claim 7 wherein, the step of connecting further comprises electrically connecting an anode of the PMT to an input of the amplifying circuit so that the amplifying circuit receives the PMT output signal from the anode of the PMT.

9. The method of claim 7 wherein, the step of connecting further comprises, electrically connecting a dynode of the PMT to an input of the amplifying circuit so that the amplifying circuit receives the PMT output signal from the dynode of the PMT.

10. The method of claim 7 wherein, the step of connecting further comprises electrically connecting an anode and a dynode of the PMT to an input of the amplifying circuit so that the amplifying circuit receives the PMT output signal

from both the anode and the dynode of the PMT.

11. The method of claim 7 wherein, the amplifying circuit in the integrating step comprises a one transistor amplifier.

12. The method of claim 7 wherein, the amplifying circuit in the integrating step comprises a multi-stage amplifier.

13. The method of claim 7 wherein, the amplifying circuit in the integrating step comprises an amplifier pulse shaper.